1. Find the inverse of the function below. Then, evaluate the inverse at $x = 8$ and choose the interval that $f^-1(8)$ belongs to.

$$f(x) = \ln(x - 4) + 2$$

A. $f^{-1}(8) \in [50.6, 61.6]$

B. $f^{-1}(8) \in [162749.79, 162758.79]$

C. $f^{-1}(8) \in [406.43, 412.43]$

D. $f^{-1}(8) \in [22026.47, 22035.47]$

E. $f^{-1}(8) \in [398.43, 402.43]$

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2. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 9x^3 + 7x^2 + 8x + 4 \text{ and } g(x) = 7x^3 + 4x^2 + 9x + 7$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-7.5, -5.5]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [3.4, 6.4]$

C. The domain is all Real numbers except $x = a$, where $a \in [2.8, 9.8]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [6.25, 10.25]$ and $b \in [5.8, 8.8]$

E. The domain is all Real numbers.

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3. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 11$ and choose the interval that $f^-1(11)$ belongs to.

$$f(x) = 5x^2 + 3$$

A. $f^{-1}(11) \in [1.47, 1.75]$

B. $f^{-1}(11) \in [5.09, 5.31]$

C. $f^{-1}(11) \in [2.19, 2.55]$

D. $f^{-1}(11) \in [1.13, 1.27]$

E. The function is not invertible for all Real numbers.

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4. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \sqrt{-4x + 14} \text{ and } g(x) = 8x^2 + 8x + 5$$

A. The domain is all Real numbers except $x = a$, where $a \in [4.33, 13.33]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-7.25, 1.75]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-2.5, 8.5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-0.67, 5.33]$ and $b \in [5.4, 10.4]$

E. The domain is all Real numbers.

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5. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -4x^3 + 3x^2 + x - 2 \text{ and } g(x) = -x^3 - 2x^2 + 3x$$

A. $(f \circ g)(1) \in [-7.5, -5.4]$

B. $(f \circ g)(1) \in [-1.8, -0.2]$

C. $(f \circ g)(1) \in [-3.8, -1.6]$

D. $(f \circ g)(1) \in [-10, -7.5]$

E. It is not possible to compose the two functions.

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6. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -2x^3 + 4x^2 - 4x \text{ and } g(x) = -x^3 + 2x^2 - x + 3$$

A. $(f \circ g)(1) \in [27, 35]$

B. $(f \circ g)(1) \in [-35, -28]$

C. $(f \circ g)(1) \in [20, 23]$

D. $(f \circ g)(1) \in [-23, -22]$

E. It is not possible to compose the two functions.

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7. Determine whether the function below is 1-1.

$$f(x) = -12x^2 - 99x - 195$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because there is an x-value that goes to 2 different y-values.

C. No, because the range of the function is not $(-\infty, \infty)$.

D. No, because there is a y-value that goes to 2 different x-values.

E. Yes, the function is 1-1.

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8. Determine whether the function below is 1-1.

$$f(x) = (5x - 36)^3$$

A. No, because there is an x-value that goes to 2 different y-values.

B. No, because the domain of the function is not $(-\infty, \infty)$.

C. Yes, the function is 1-1.

D. No, because the range of the function is not $(-\infty, \infty)$.

E. No, because there is a y-value that goes to 2 different x-values.

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9. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = \ln(x - 5) - 4$$

A. $f^{-1}(7) \in [59862.14, 59872.14]$

B. $f^{-1}(7) \in [24.09, 28.09]$

C. $f^{-1}(7) \in [162746.79, 162754.79]$

D. $f^{-1}(7) \in [0.39, 10.39]$

E. $f^{-1}(7) \in [59879.14, 59883.14]$

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10. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -14$ and choose the interval that $f^-1(-14)$ belongs to.

$$f(x) = 4x^2 + 3$$

A. $f^{-1}(-14) \in [1.53, 1.84]$

B. $f^{-1}(-14) \in [2.88, 3.62]$

C. $f^{-1}(-14) \in [1.89, 2.14]$

D. $f^{-1}(-14) \in [3.81, 4.19]$

E. The function is not invertible for all Real numbers.
